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Reconsidering the livestock value chain in dryland areas for resilience building

Shuaib Lwas[1], William Obonyo Otoke[2], , Stephen Kodet2 Josephat Aryatwijuka[1]
[1]*Department of Geography Geo-Informatics and Climatic Sciences, Makerere University*
[2]*Mercy Corps, Uganda*
Presenter: Shuaib Lwasa shuaiblwasa@gmail.com

Climate change threatens development and economic growth in Uganda with significant impacts on economic activity and value chains. Economic actors are forced to alter their production systems to maintain their production capabilities under changing climate conditions. However, climate change can also lead to new possibilities for people and businesses, with opportunities to create new products and services, develop new markets and access new funding streams and finance mechanisms. Adapting to the impacts of climate change and taking advantage of opportunities arising. The Karamoja region produces approximately 20% of Uganda's livestock with the returns per hectare of land in pastoral areas of Karamoja estimated to be nearly 7 times higher than returns from ranching systems in south-western Uganda. We apply the livestock Value Chain assessment approach to understand the potential of tapping opportunities of the value chain to build resilience. Different market assessments for livestock in Karamoja have been conducted but all underestimate the economic value of the sector. This is also the case for pastoral areas across the greater Horn of Africa region, where extensive livestock production systems were worth an estimated $1 billion in 2010. As such, there is a growing case for investment in livestock systems as an opportunity for climate-resilient economic development. Pastoralism has exemplified systems of adaptation to a variable climate in the region. The aforementioned value chain analysis for Karamoja shows that the livestock value chain from product development has a potential to improve the products that could sustain good variable prices and enhance resilience to impacts of climate change. This study explores the opportunities of climate change adaptations from product development, through trade, transportation and consumption that could contribute to building resilience of pastoralism in Karamoja and beyond.

Keywords; value chain, livestock, Karamoja, resilience, climate risks

1. Introduction

The Karamoja region is predominantly agro-pastoralist with long standing experience of variable climatic conditions arguably suitable for pastoralist activities although scaled agriculture has recently increased. The region is characterized by varied ecology that supports livestock with a little more moist sub-region to the west that supports agricultural production. The livelihood systems revolve and evolve around livestock with semi-developed value chains linking Karamoja to the nearby national and international markets. Livestock farming of pastoralism in nature is the traditional economic and cultural livelihood, of the region (District, District, and Government 2013). Crop production is recently for both income but has always been predominantly for food to supplement the animal protein. In the last decades, a staggering number of livestock in the region of Karamoja is reported due to tribal conflicts, war and a variable climate that has increasingly impacted on pastoralist activities (Ayoo, Opio, and Kakisa 2013; Ezaga 2010). As a result some families have fewer numbers of animals, yet basic living is largely based on the sell of live animals, meat, hides, skins, dairy products. This paper analyses the livestock value chain based on surveys in two districts of Napak and Moroto. The value chains are live animals and meat,. In this assessment, the focus is on the holistic process of production, transformation (or Value Addition) to consumption and final disposal of live animals and meat. The value chain assessment covers input services, supporting functions and enabling environment for the value chain Kaplinsky & Morris, (2000). This full range of activities are required to bring a product or service from conception, through different phases of production (involving transformation and the input of various producer services) is assessed in respect to the constraints and opportunities for enhancing value chains. This is to identify stages at which the value can be captured. The broad definition of value chains by FAO,(2011), informs this study and value chains are considered as groups of people linked by an activity to supply a specific commodity. The value chain assessment tracks the different actors from production to different actors to consumption. The study objectives are; *a)* map out the flow of demand and supply of value chain products, which should include live animals, meat, milk products, hides and skins; *b)* assess the effectiveness of inputs and services such as appropriate feeds, animal health, extension services, and finance; *c)* analyze the market opportunities in Districts for the various Livestock products. According to Kaplinsky & Morris, (2000), Value chain analysis (VCA) overcomes a number of important weaknesses of the conventional way of looking at economic products. Ca-ciamarra, (2011) notes that VCA helps to understand how farmers are linked to markets as a basis for promoting growth and reduction of poverty.

1.1. Research Design and methods

The standard Value Chain Analysis approach by FAO, considers the value capture at the different stages of product development, transformation and utility (FAO 2011). The approach to the assessment makes use of the multiple steps in analysis. A collection and review of secondary documents was the first step in the value chain analysis. The second step involved the collection of primary data from the field through structured interviews using questionnaires and focus group discussions to capture support functions, constraints and opportunities that influence the value chain. Interviews were conducted with key stakeholders along the value chains at kraal level, livestock markets and key stakeholders. The data was compiled and analysed to calculate value estimates using a standard set of indicators along the value chains.

2. Methods

A combination of methods was used in the assessment. Data on production inputs, costs of inputs, costs for transportation, fattening in regard to live animals and the support functions was generated from a total 272 actors. 76 interviewees for live animals and meat were interviewed in addition to 5 FGDs with 15 participants each, which were carried out in the five sub-counties. Four enumerators and four supervisors were trained using drafted research tools. The enumerators and Mercy Corps staff helped in adapting the

research tools to the regional specificities. A two-day training workshop was organized in Moroto between January 15-17 2016 followed by a pilot of one day before rolling out for an extended data collection exercise. Participants for the Focus Group Discussions included farmers, traders, processors, district production officer, transporter and consumers for the four selected five sub-counties in Moroto and Napak. Data were collected with a structured questionnaire was from the producers, traders, transporter, processors and consumers. The variables of focus included; fattening, production costs, transportation costs, total harvests, price and location where products are sold. Focus group discussions were conducted with guided questions in each selected sub county, with each focus group discussion comprising of minimum 15 farmers, producers, processors, transporters and consumers up was held (see Table 1). Focus Group Discussions were conducted and moderated by enumerators with the guide of field supervisors.

Table 1: Selected sub-counties of the study area

Region	**District**	**Sub-county**
Karamoja	Moroto	South Division Nadunget
	Napak	Matany Kangole Iriiri

Producers/farmers, traders, processors, transporters and consumers were major participants in FGDs held in both districts. These participants provided information on the key value chain actors within the region, the local support functions and market environment and gender related issues. The actors in the value chains operate in differing locations including Kenya, Kampala, Soroti, Mbale and Katakwi and Karamoja region.

2.1.1.Review of existing materials

Documentary Review was one of the strategies for understanding the value chains in the region as well as the functional and support services to value chains. Documentary review provided information on the value added of the value chains for live animals, meat market is overall structured in the region. This study examined the relevant literature such as reports published on selected value chains by Ministry of Agriculture Animal Industries and Fisheries, research reports and value chain assessment commissioned studies. The conclusions and summaries of these studies were utilized in mapping of the relevant value chains and helped ascertaining the constraints and opportunities of the value chains.

2.1.2.VCA Analysis

The economic analysis was based on market prices and costs. This analysis quantified the production estimates as collected from actors. The basic units of analysis were number of animals per category and unit production in kilograms (for maize and meat). Costs of inputs along the chain were estimated on basis of these basic units of analysis. For live animals, costs of input were estimated for fattening, treatment, transportation and other costs related to the value chain stage. Derived estimates for product value along the chain are based on indicators including; *total costs, price per unit*, *gross sales value*, *profit margin, profit per unit of production, costs per unit of production, profit as a proportion to gross*

value. Average values of these indicators are calculated and used in the analysis of value. Table 2 explains the analysis indicators as below.

Table 2: Description of indicators for analysis

Indicator	Description of indicator
Total costs	A sum of all estimated costs of production**, transportation, processing, administrative fees, market dues, storage costs and any other costs
Price per unit	The prevailing market price at the time of interview. Price for selling is differentiated from price at buying where appropriate
Gross sales value	The product of unit product sold and prevailing market price
Profit margin	The difference between total costs subtracted from gross sales value and operational costs
Profit per unit of production	The ratio of the profit margin per unit of production
Cost per unit of production	The ratio of total costs per unit of production
Profit as a proportion to gross value	The ratio of profit margin to the gross value
Average prices	The average price of all sold units at different stages of the value chain per value chain
Average value	The average value of all sold units at different stages of the value chain per value chain
Proportion of profit margin at each stage	The ratio of profit margin as compared for each value chain at various stages to the different actors

*** Production costs are an underestimate due to the complexity of monetizing inputs, variations among actors and social values to the products like livestock. Thus all estimates should be considered as an underestimate*

3. Results

Mapping value chain actors and processes

A general mapping of the selected Value Chains was conducted utilizing Grote & Winter, (2009) framework. In respect to the selected value chains, product development is accomplished by pastoralists as the first stage in the value chains. In the case for live animals, the farmers acquire calf's or bulls for fattening and treat the animals after a period ranging from six months for shoats to years for bulls.

Depending on the reason for selling, the animals are put on market for interested buyers. Brokers and traders link buyers together with sellers although dominant in the region is the process where sellers directly negotiate with the buyers at a designated livestock market area. Each district has a market designated, developed and constructed for the purpose and is a weekly market. Live animals are sold to traders or processors with the latter transforming the product by slaughtering and selling meat, offals and other products to consumers. Consumers include hotel operators, household consumers, while skins and hides are sold to traders who take them to tanneries outside of Karamoja.

Figure 1 Value chain actors from producer/farmers to consumer

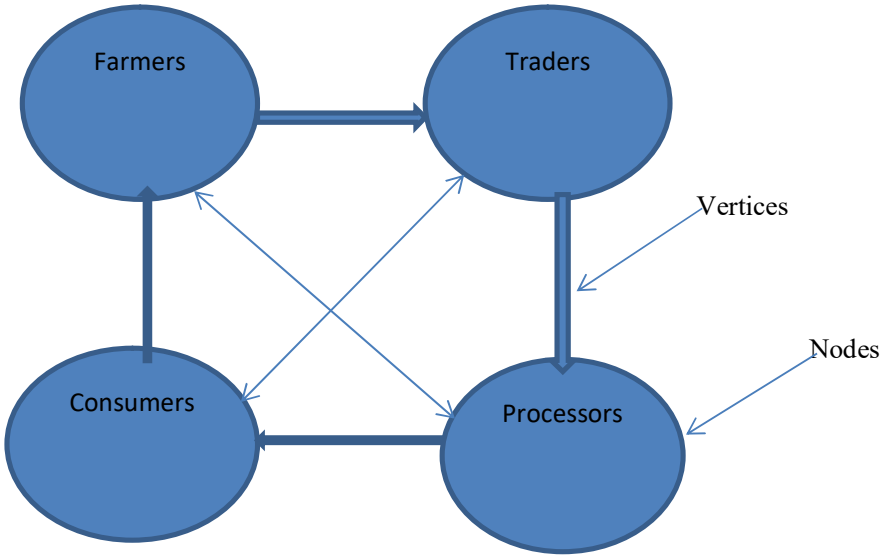


Figure 2: A general mapping of Livestock and meat value chains

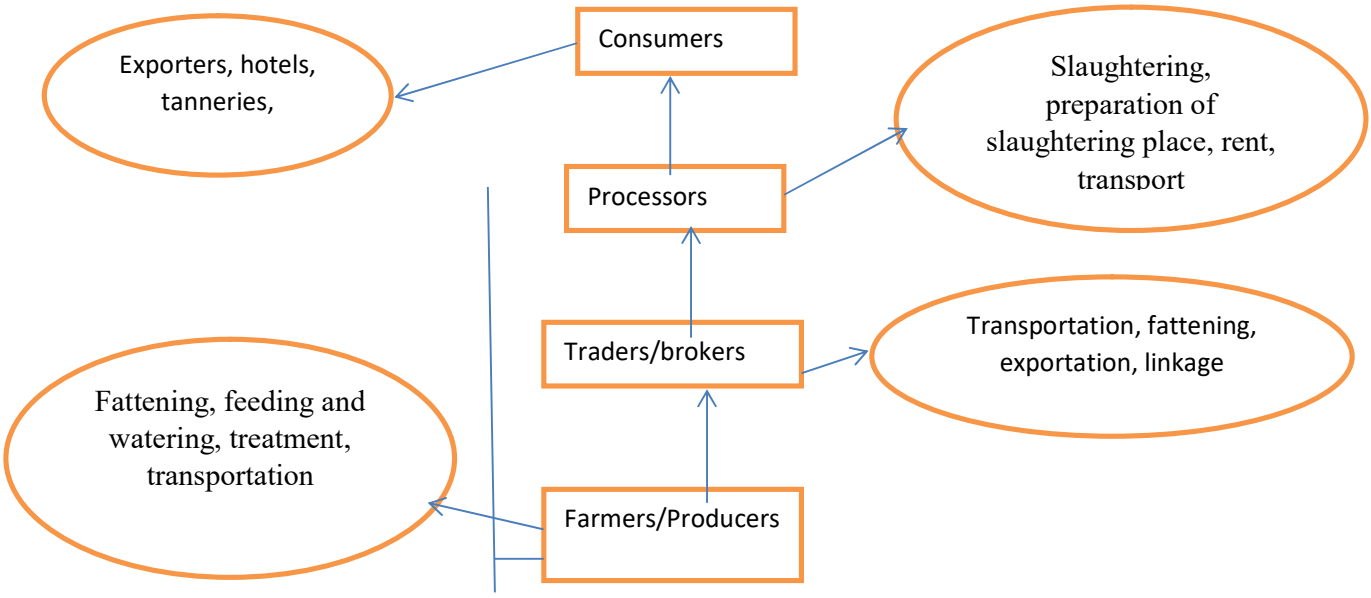
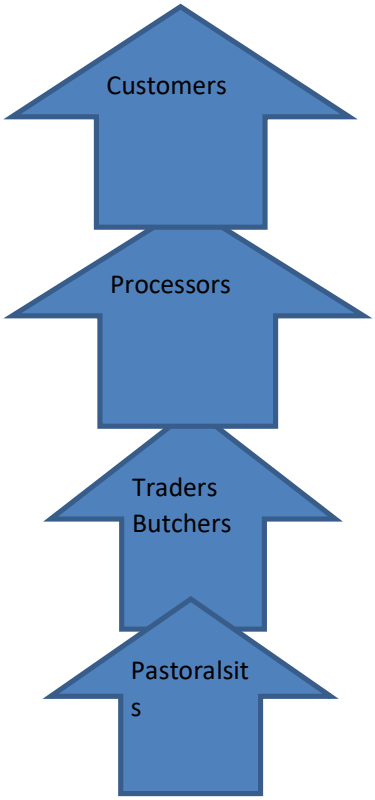


Figure 3: General mapping of live animals meat value chains

Fattening



3.1. Live Animal Value Chain

3.1.1. Production stage

In Karamoja live animal value chain has developed into a series of complex constituents involving various actors of producers, Traders, Processors, Transporters and consumers. Live animal in this assessment included, cattle, shoats (goats and sheep), Pigs and Poultry. Producer activities range from feeding, watering and treatment for fattening. Farmer-price of animals depends on the size, health and sex. The fattening process is important just as the inputs for value addition. When the animals are mature, health bulls or Oxen fetch a higher price than calves and heifers or unhealthy animals. Livestock and the associated value chains are the primary economic and social cultural undertaking in the region. Animals play an important role in the social economic lives of Karamajong. Live animals are a medium through which farmers in parts like Moroto access other requirements through the market. Animal producers sell to buy food, pay medication and school fees including local brew. The figure 4 below shows healthy bulls brought to Nakwatae and poultry in Matany. Poultry supports family especially women as source of income and also food in form of meat protein. The gross value sold by farmers of oxen, cows and bulls is 243,500,000 million Shs with an average profit margin per producer of 7,355,900 Shs. The average number of animals sold by farmers is 8 with an average prevailing market value of 1,111,290 Shs per animal. Producers are the main and first contributors in the value chain.

Figure 4: Live animals and chickens at a market

Source; field photos

Value Chain	Cost of fattening per cattle	Total animals in last six month	Estimate weight of last sold	Price per cattle	Transportation cost	Other cost of production	Total costs	Gross Sale Value	Profit margin	Profit margin as proportion of gross value	Profit per unit of production	Cost of production per unit produced
AV	6,129	8	893	1,111,290	10,710	46,477	497,235	7,853,226	7,355,990	94	1,047,974	63,316
STDV	18,789	8	1,073	355,761	6,793	51,410	923,914	7,352,298	6,836,927	6	366,435	57,836
MIN	-	1	100	355,761	3,000	-	11,800	700,000	582,000	6	366,435	3,000
MAX	100,000	30	4,500	2,500,000	40,000	150,000	4,800,000	25,000,000	23,625,000	100	2,485,000	218,000
RANGE	100,000	29	4,400	2,144,239	37,000	150,000	4,788,200	24,300,000	23,043,000	94	2,118,565	215,000
Gross	190,000	250	27,675	34,450,000	332,000	1,440,800	15,414,300	243,450,000	228,035,700	2,906	32,487,200	1,962,800

Table 3: Estimates for cows, bulls and oxen

** *Values in Uganda Shillings*

Value Chain	Cost of fattening per cattle	Total animals in last six month	Estimate weight of last sold	Price per shoat	Transportation cost	Other cost of production	Total costs	Gross Sale Value	Profit margin	Profit margin as proportion of gross value	Profit per unit of production	Cost of production per unit produced
AV	14,273	15	274	120,545	4,182	28,636	47,091	1,786,000	1,738,909	92	110,370	10,175
STDV	30,258	18	304	46,867	14,895	25,997	44,751	3,034,573	3,029,035	11	44,518	15,955
MIN	-	1	12	60,000	-	-	6,000	142,000	101,000	59	57,500	629
MAX	100,000	72	1,080	200,000	70,000	90,000	180,000	14,400,000	14,335,000	100	199,097	60,000
RANGE	100,000	71	1,068	140,000	70,000	90,000	174,000	14,258,000	14,234,000	41	141,597	59,371
Gross	314,000	319	6,033	2,652,000	92,000	630,000	1,036,000	39,292,000	38,256,000			

Table 4: Production Estimates Shoats

*** Values in Uganda Shillings*

Value Chain	Cost of production	Total animals in last six month	Estimate weight of last sold	Price per bird	Transportation cost	Other cost of production	Total costs	Gross Sale Value	Profit margin	Profit per unit of production	Cost of production per unit produced
AV	71,933	25	78	24,250	1,250	71,125	74,679	465,063	390,384	16,108	8,142
STDV	129,533	41	128	22,591	3,108	155,120	125,381	691,970	644,339	31,893	21,342
MIN	-	1	-	-	-	-	-	-	(380,000)	(76,000)	-
MAX	420,000	150	450	75,000	10,000	465,000	430,000	2,250,000	1,950,000	70,350	86,000
RANGE	420,000	149	450	75,000	10,000	465,000	430,000	2,250,000	2,330,000	146,350	86,000
Gross	1,079,000	401	1,167	388,000	15,000	1,138,000	1,194,858	7,441,000	6,246,142		

Table 4: Estimates Shoats

*** Values in Uganda Shillings*

3.1.1. Input Supply Stage

The Producers rear cattle, shoats, in order of importance. They herd their animals to market sometimes hiring labor. Market and pricing information is difficult to get on part of the producers only almost accessible at the market. The price they receive is either the previous week's price or not the best price they could obtain if they had access to better and more timely information. The prevailing market is also determined by the health and size of the animal. Animals that look skinny and unhealthy, tearing and

foaming on the mouth fetch less price compared to health bulls. Visual methods are used to determine the health of the live animals. There were several animals observed at the markets, which looked unhealthy. This is evidence that producers sell for a variety of reasons including health so that they don't incur costs of treatment or are selective to retain the healthy bulls and cows for future use. Cows were seen as most predominantly unhealthy and mostly at the time when fertility is uncertain. Large animal herds are considered signs of affluence and prestige as per Karamojong culture, so many producers only go to market when they want to buy food, financial problems or face drought. Sell of animals though not common at household level, it is the means through which other requirements are met.

Value Chain	Total animals sold in six month	Transportation cost per animal	Cost of movement permit	Transport Costs	Other costs cost	Market dues per animal	Price at buying per animal	Selling Price per animal	Total costs	Gross sales value	Profit margin	Profit per unit of production	Cost of transportation per unit produced
AV	46	8,333	3,955	852,273	152,227	5,455	979,545	1,230,455	1,967,773	45,387,273	6,396,773	176,090	74,819
STDV	110	10,160	7,088	3,187,399	636,749	2,627	319,471	418,984	3,522,909	95,487,347	15,436,204	158,899	99,132
MIN	1	-	-	-	-	1,500	500,000	600,000	7,000	820,000	(772,500)	(51,500)	3,500
MAX	500	36,000	30,000	15,000,000	3,000,000	10,000	1,600,000	2,100,000	15,055,000	425,000,000	70,085,000	496,500	317,200
RANGE	499	36,000	30,000	15,000,000	3,000,000	8,500	1,100,000	1,500,000	15,048,000	424,180,000	70,857,500	548,000	313,700
Gross	1,002	175,000	87,000	18,750,000	3,349,000	120,000	21,550,000	27,070,000	43,291,000	998,520,000	140,729,000		

Table 5: Estimates cows, Bulls, Oxen trading stage

** *Values in Uganda Shillings*

As shown in the table 5 above, the average number of animals sold by a trader in the last six month is 46, which is an average of 5 per month. But there are traders who sold more than 100 animals. The traders go to the farmers and buy the animals or buy from the market where farmers bring the animals and transport the live animals to distant markets like in Juba. Kampala, Soroti and Kenya. The gross value of traded animals is estimated at nearly 1 billion Shs and compared to the profit margin is 140,729,000 Shs. The average profit margin per animal is 176,090 Shs which ranges between 21% – 25% profit for the traders along the value chain.

3.1.1.Processing, Trading and Retailing Stage

Processors include those who buy animals and slaughter them purposely to sell meat and other products such as offal, hides and skin and hooves. Processors play an important role in value addition of the animal into meat. Processors slaughter, skin, wash and clean the meat, which is then put on market directly. Some processors have their own butchers where they sell meat to consumers direct. Meat processing in Moroto and Napak is carried out in abattoirs where after slaughtering meat transported by use of wheelbarrows to butchers but also with minimal value addition. The photograph below shows abattoir in Nabatua south division where meat processing mainly take place.

Figure 5: The Abattoir in Moroto Municipality

Value Chain	Buying Price per animal	Inspection costs	Slaughtering costs	Cost of movement permit	Other costs	Selling Price per kg of meat	Selling Price of offal	Selling Price of hooves	Selling Price of hides and skins	Total costs with average animals 46	Gross sales value	Sales value per bull	Profit margin	Profit margin as proportion of gross value
AV	813,636	273	7,091	-	6,591	7,318	3,909	19,636	11,091	641,909	57,716,000	1,254,696	441,059	35
STDV	324,107	905	2,587	-	5,809	462	3,300	15,661	4,700	344,916	6,760,042	146,957	335,265	27
MIN	100,000	-	2,000	-	-	7,000	-	6,000	5,000	230,000	49,409,000	1,074,109	38,326	3
MAX	1,200,000	3,000	10,000	-	15,000	8,000	7,000	45,000	20,000	1,150,000	68,090,000	1,480,217	982,217	91
RANGE	1,100,000	3,000	8,000	-	15,000	1,000	7,000	39,000	15,000	920,000	18,681,000	406,109	943,891	88
Gross	8,950,000	3,000	78,000	-	72,500	80,500	43,000	216,000	122,000	7,061,000	634,876,000	13,801,652	4,851,652	

Table 6: Estimates for processors

** *Values in Uganda Shillings*

Processors buy animals from producers/farmers at an average of 813,636 Shs as shown in the table above. The processing involves slaughtering and the meat is sold as beef, offal, hooves and skin and hides. The gross value of processed products from live animals is 634,876 Shs of the surveyed processors. The average profit margin at this stage is 441,059 Shs and varying proportion of the profit margins as a percentage of gross profits. This variation brings in the issue of health of animals, source of the animals and on a few occasions the sick and dead animals that are slaughtered by local individuals and are not brought to the abattoir or butchers. They are sold with in the backyard at a lower price compared to the healthy animals in butchers.

Figure 6: Traders loading their animals in Nadunget to be transported to Kampala

Shoats are sometime transported with cattle, but normally separated where smaller trucks transport them.

3.1.1. Consumption stage and end users

There are both animal traders buying on large-scale and transport to Kampala, Kenya and Juba as well as traders who buy at small scale supplying abattoirs and local market. Large-scale traders, are few in number but are established in the value chain of live animals. Large-scale traders operate in different markets purchasing animals usually healthy bulls, oxen and health cows. Small-scale traders on the other hand trade within Karamoja region while others come from out of Karamoja from Kampala, Soroti, Katakwi, Mbale and Kenya.

3.2. Meat Value Chain

The meat value chain is a transformed product from live animals. The product is after slaughter of live animals to produce consumable beef. The improved product in quality and price along the chain is accessed by various actors of the consumer category through marketing and sales. In the marketing chain, there are many actors whose activities influence the value of meat and other services exchanged from producer to consumer. The market chain is interlinked right from animal production, farm-gate sales, transporting, processing to meat, and marketing up to consumption. Farmers sell animals to traders or processors from the kraal or market. Animals are transported to slaughtering places (abattoirs) either in Karamoja or out of Karamoja, they are slaughtered and transported to butchers in Moroto Municipality, Kangole trading centre and Matany trading centre.

Animals transported out of Karamoja like in Kampala, Juba and Kenya are processed and beef packed refrigerated as a value addition to fetch higher prices in high-end outlets. Meat production in Karamoja is not well developed although it is of major importance, a product from cattle and shoats. Meat consumption by households is very low when compared to the amount of meat households consume per month. From the survey, consumption was between 1- 6 kg, which is very low, only restaurants and hotel owners buy more meat for their customers some of whom are locals but many are also people working in the region. In Moroto municipality regardless of more population there is only one abattoir, which is used, by the whole municipality. This indicates under performance of meat product and indicative of the exportation of live animals from the region. The price of meat at the butchers depends on the type of animal but some areas price of meat for shoats is equivalent to the price of cattle beef. Price for beef ranges from 6,000 Shs in Napak to 8,000 Shs per kg in Moroto municipality. The price of shoats' meat ranges from 7,000 Shs – 8,000 Shs in all areas, some local people slaughter animals whose meat is sold in the backyard at a cheaper price and with no standard weighing scale. In this kind of trading a piece of meat is sold between 3,000 - 4, 500 Shs. These animals whose meat is sold cheaply according to interviewers are suspected to the sick, very old or stolen. The consumer categories include residents, hotels and restaurant. The low consumption of beef in the region could be related to cultural functions in which shoats are used for such rituals implying that households eat meat produced at local level for functions and not from the market. This implies that some animals don't make it to the markets but are consumed locally by the farmers in the kraals.

3.3. Synthesis of value chain

Cattle				
Value Chain Stage	**Average Cost Per unit**	**Average value per unit**	**Average Profit per unit**	**Proportion of value**
Producer	63,316	1,111,290	1,047,974	20.4
Trader	74,819	1,230,455	176,090	22.6
Transporter***	30,002	1,856,250	1,826,248	34.0
Processor	13,955	1,254,696	441,059	23.0
		5,452,691		

Table 7: Estimates for all stages of value chain excluding meat consumption

*** Values in Uganda Shillings*

**** Most transporters were also traders or brokers implying that they maximize the value along the chain*

From the table 7 above, it shows that the cost per animal along the value chain varies with the trader incurring higher average costs than any of the actors along the chain. Traders are subjected to various fees and dues as well as permits that increase costs some of which may not be official. From FGD's the traders mentioned the check-points at the district boundaries coupled with police along the routes which increase the costs of operation. On the other hand, the producers' costs are low estimates of the true value as mentioned earlier. The calculated profit per animal is higher among the transporters and this is because most of the transporters also double as traders. Thus the biggest proportion of profits along the chain are gained by the transporters at 34% who double as traders.

Producer*s*; producers/farmers sell their animals to traders or processors in the market place or abattoirs, producers play a role of taking care of animals, fattening and feeding animals sometimes they pay transport costs if traders have not collected animals from the farm-gate kraals. The proportion of value that goes to producers is 20.4%. ***Traders;*** traders take their animals to the processors, some traders buy animals take them to the abattoirs and abattoir operators helps to slaughter and clean the meat and the trader incurs costs for processing at the abattoir. The meat is then transported to the butcher often transported cheaply with wheel barrows at an average price of 1,300 Shs. Offals and hooves are separated as products along the chain others need a mixture of meat and offal. Hooves are normally sold as a pair or 4 leg hooves and ahead at 4,5000 Shs. Meat traders pay for market dues for the stamp. Traders pay 3,000 Shs for cattle and 1000 Shs for shoats. The proportion of value that goes to the traders is the largest for cattle traders at 34% while only an estimated 6% of this proportion goes for the meat traders.

Processors; p*rocessors* play biggest role in adding value on meat. From slaughtering animals cleaning they sell meat to downstream traders who take meat to their butchers. These require the services of transporters who transport the animals from rural areas. Transportation of meat from abattoirs to butchers is commonly by use of wheelbarrow. ***Consumers****;* Consumers are the last in the value chain of meat/beef. Consumers pay for the highest price of the product a value of 8,000sh in Moroto and 7,000sh in Napak. Meat consumers also include those that consume it when animals are sold out Karamoja.

Table 8: comparative assessment of the districts surveyed

Value chains	Napak	Moroto
Live animals	Animals are at lower price compared to Moroto In Iriiri traders are very few with few animals brought to the market	Live animals fetch more price than in Napak Market has more traders than in Napak
Meat	Meat is at lower price that is 7000-7500 Butchers are somehow improved	Meat is sold at 8000 in butchers. Butchers are not well developed
Maize	Maize is highly produced than in Moroto Low price for maize compared to Moroto	No maize production in Moroto More traders but they buy from Napak market
Green gram	Green gram is grown but by few producers No processing for green gram	No producers identified No traders found in Nadunget for green gram but more traders in south division

3.3.1.Opportunities for livestock and meat in Karamoja

Livestock is the main source of survival for people in Karamoja, they provide milk, meat, source of income. Animals are sold to buy food, thus livestock sector in Karamoja presents great opportunity to both farmers and traders who are engaged in animal rearing and trade. Oxen are used for ploughing during planting seasons and they are used in transportation of harvests, water, construction poles to Manyattas. Livestock is important in the social economic lives of Karamajongs. Although there seems a plausible possibility of diversifying the Karamoja economy, little is known about the risks and feasibility. There has been increased government and NGOs support in the region in provision of services and improving of infrastructures such as roads, water dams and boreholes. This has played a great role of reducing long distance that shepherds used to walk in search of water and pasture given extended water sources in the region. Thus there is a great potential of increasing livestock numbers and livestock products such as meat if the support function around infrastructure can be greatly improved. In fact there is observed progress in improving the quality of animals in the region.

There has been increased demand of live animals as a result of increased demand for meat in Karamoja and out of Karamoja. This is attributed to increased urban settlers with higher incomes. An opportunity of increased market for cattle and cattle products exists for exploitation. Following successful disarmament in Karamoja, there has been peace with a reduction in cattle rustling that was a problem. Thus loss of livestock to cattle rustlers has reduced given peace prevailing in the region. Restocking will therefore play an important role in harnessing the opportunities of livestock sector but in view of the changing climate and availability of pastures and water, there has to be improved methods of fattening. There has been increased financial institutions commercial Banks and SACCOs that provide financial assistance to famers and traders in Moroto. Although in Napak they are not well developed, but financial institution

provide loans to traders and producers. This helps them to provide production inputs, like drugs and fattening of their animals. Government together with NGOs provide extension services to farmers, for instance UNDP provide free animal treatment, while government has supported training community-based veterinary health workers to improve animal health.

4. Discussion

Rich, et al (2010) mentions that livestock systems that are pastoralist in nature are characterized by marketing chains featuring great distances, numerous phases of weight gain due to fattening and feeding regimes, multiple levels of traders and transactions, a multitude of steps and stages of processing, and a variety of employment-creating services and inputs. On the consumer side, the delivery of livestock products through markets tends to serve a variety of consumers, with potential multiplier effects for development interventions (Rich et al., 2011, Ca-ciamarra, 2011). Ideally each actor in the chain makes a profit (Pica-Ciamarra et al, 2005). The value chain analysis in this report adopts the FAO framework and that of Grote & Winter, (2009) that illustrates the value chain nodes and links in form of a matrix. The nodes represent the actors while the links describe the relationships and flows between the nodes. The analysis of the value chains shows that the product, the inputs for product development, supporting functions and enabling function for each actor group along the value chain are intertwined with cultural practices. The flows between the actor nodes includes the product that is traded and then later consumed, traded again as is or after a transformation into other products. The economic value analysis also illustrates limited valuation of the value chain and thus the potential for maximizing benefits is yet to be harnessed. The full potential of livestock value chain in Karamoja is underestimated. Even when this assessment didn't cover all the markets and districts, it is clear that improving functional services would increase the capture of the value along the value chain.

5. Conclusion

This assessment concludes that there are various actors for each value chain assessed that unpacking the roles and linkages along the chain has enabled understanding the possibilities for enhancing the value chain to transform Karamoja region. The assessed value chains are also of significant importance to the livelihoods of the people in the region. Despite being the focus of many interventions, a deepened analysis of how the values along the chains can be enhanced has not been attained. The key findings of this assessment indicate that there is disproportionate distribution of the value of the chains but in all farmers who are product developers receive a dismal share of the value. For live animals, meat and maize the disproportional share by farmers signifies importance of investing into cooperatives for marketing, utilizing ICT, cooperatives for transportation if farmers in Karamoja will get a good share of the values of the chains. Functional and support services have to be stepped up within the policy environment to enhance the value chains.

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